

Emission Reduction in Waterless Printing Operations

By Debra Jacobson, PNEAC

Cup/food container manufacturer reduces VOC emissions and saves money with alternative cleaning product used in their waterless offset printing division.

Related Products/Industry: Waterless Offset Printing on beverage cans, cup/food containers, plastic pails, etc.

WinCup, Inc. is a foam cup and food container manufacturing company with manufacturing plants located throughout the U.S. Their manufacturing process includes printing logos and other graphics onto pre-formed styrofoam cups and other food containers through a waterless offset printing process (other wise known as "dry offset").

Problem: WinCup, Inc had been using isopropyl alcohol (IPA) to clean ink and related soil off their printing equipment after a job was run. Isopropyl alcohol is considered a VOC emission source by EPA and is a flammable substance with a flash point of 54 F. Flammable materials are subject to stringent storage and handling rules, additionally the user may be limited to the amount they can store on site at any one time.

Goal: Due to increasing air emission regulatory limitations, and concerns about worker safety due to the use of a flammable cleaning product; WinCup wanted to identify an alternative cleaning product that worked just as well as the IPA at removing ink and other residues from the printing presses and related parts, yet met their VOC emissions reduction goals.

Course of Action: The company began working with a supplier who was familiar with the printing industry and distributes their products to gravure, flexographic and offset printers. The supplier began by talking with top management officials to get an understanding of their business and then began working with production personnel to develop an understanding of any special needs and concerns regarding their printing process and application of the current cleaning solvent. This helped the supplier make recommendations that would best fit the needs of top management, reducing VOC without significantly increasing costs; and the needs of production personnel, which was to avoid sacrificing cleaning performance or significantly increasing work.

Based on this information their supplier recommended several different products, each with varying performance estimates and costs. The company decided to test Danko Industries' Wash-Up Evap A, which appeared to be best suited for their specific application. Wash-Up Evap A is 100% VOC (based on method 24 analysis), but has a vapor pressure of 8.3 mm Hg @ 68 F (20 C) and a flash point of 143 F. Materials with a high VOC content (100%) and a vapor pressure less than 10 mm Hg @ 20 C are equivalent to a VOC content of 30% by weight.

The new product required a slightly modified application procedure. The product is applied by moistening a towel with Wash-up Evap A, wiping down the soiled parts, followed by wiping it down a second time with a dry towel. Representatives of Danko came to WinCup's facility and trained their press crew on how to

properly apply the product for maximum performance, then the employees were allowed to use the product on their own for four weeks. During the test period Danko representatives regularly contacted management and production personnel to answer any questions or discuss any problems associated with performance and application of the product.

After the four week test period Danko representatives returned to the facility to discuss continued use of their product. Based on product performance the entire company was very pleased, but the cost of the product was significantly greater than the isopropyl alcohol. The supplier was able to show that although the price per gallon of the Wash-Up Evap A was significantly more than the isopropyl alcohol, the company would actually save money because they would use much less product. As a result the company decided to begin using the Wash-Up Evap A in their West Chicago, Illinois facility. If the supplier's cost savings estimates proved to be accurate, then the company would consider using the same product in other plants.

Result: Based on the 1997 purchase records for the West Chicago, IL plant, WinCup was using approximately 8633 lbs per year of isopropyl alcohol. This generated approximately 4.32 tons of VOC emissions per year. Due to air emissions permit limitations WinCup was forced to limit their production and cleaning activities while using IPA. By switching to Wash-up Evap A the company was able to reduce VOC emissions from press cleaning activities by 66% (approximately 2.85 tons VOC) and improve worker safety. This reduction also created an opportunity to increase production without concern of exceeding their air emission permit limits. WinCup estimates they have been able to produce 550 lbs more material for every 1 gallon of IPA they eliminated (based on emission factor).

The clean-up waste from the Wash-Up Evap A is not considered a hazardous because it does not meet U.S. EPA's or Illinois EPA's' definition of a hazardous waste. Even though it is not subject to considerable regulation and high cost of disposal as compared to hazardous waste streams it cannot be discharged into the sanitary sewer. In Illinois the waste must be manifested and disposed of as a non-hazardous special waste. Each state's waste disposal regulations differ slightly and their regulations should be reviewed to determine how the waste must be disposed of.

WinCup is now beginning to use Wash-Up Evap A at their Stone Mountain, Georgia and Phoenix, Arizona plants, while their California and New Jersey plants are currently testing/reviewing the product.

	VOC Content	HAP Content	Vapor Pressure	Flash Point	Annual Usage
Wash-Up Evap A	100%	None	8.3 mm Hg @ 20 C	143 F	7 Drums or 385 gal
IPA	100%	None	33 mm Hg @ 20 C	54 F	24 Drums or 1320 gal

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